



Storage Solution

# SpycerBox

Hardware Guide



# SpycerBox Hardware Guide

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Hardware Guide Version 1.0 for the SpycerBox

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# Registration Form

Dear customer,

this product was developed and tested thoroughly. Unfortunately, the possibility of problems and errors can never be ruled out. To support us in helping you as fast as possible if such a case occurs, please fill in this registration form and send or fax it to the address on the right.

You may also use our online registration form which can be accessed from the following internet page: <http://www.dvs.de/english/support/support.html>

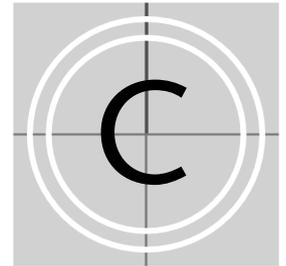
PLEASE SEND TO:

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<b>Customer</b>	
Name:	_____
Company:	_____
Contact:	_____
Address:	_____ _____ _____
Phone:	_____
Fax:	_____
Vendor:	_____
<b>SpycerBox</b>	
Serial No.:	_____
Remarks:	_____ _____ _____ _____
<b>Connected devices</b> (used network connections, connected storages, file systems, etc.)	
	_____ _____ _____ _____ _____



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# Introduction



This documentation describes how to use the hardware of the SpycerBox manufactured by DVS. The SpycerBox is a multi-purpose storage as well as server device delivered with several data management tools. It is the ideal solution for users at broadcast and post production facilities who want to make the most of their file-based workflow. The SpycerBox can be used for several purposes, for example, as ...

- ... a high-performance automated backup and archiving solution,
- ... a powerful file server with proxy clip generation for a SAN, or
- ... as an NAS solution for the whole network.

Together with the powerful and reliable hardware of the SpycerBox you also receive the SpycerBox software, an extended version of DVS's award-winning data management software Spycer. With the SpycerBox software you can, for instance, automatically create low-resolution proxy video clips of the content on the local or a connected storage, defragment an SNFS storage such as a SAN, or perform scheduled maintenance tasks automatically in your network.

The SpycerBox hardware will be equipped with Linux as its operating system and a storage capacity of 24 TB. Optionally available are various connection possibilities to integrate the system seamlessly into your workflow.



## 1.1 Overview

This guide informs you about the operation of the SpycerBox hardware, all its connection possibilities and its installation. Furthermore, it describes some maintenance tasks that you may carry out on your own.

The chapters contain the following information:

Chapter 1	Begins with a short introduction to the SpycerBox, followed by a note regarding the audience this manual is written for and an explanation of the conventions used in this manual. Furthermore, it provides safety instructions that you must adhere to and some important notes that you should observe.
Chapter 2	This chapter gives a front and rear overview of the system detailing all items, connectors and interfaces.
Chapter 3	Describes the hardware installation of the SpycerBox.
Chapter 4	Explains how to operate the SpycerBox, i.e. how to start and shut down the device.
Chapter 5	Details maintenance work in case of a hard disk, fan or power supply unit failure.
Appendix	Provides technical details and general information about the SpycerBox hardware. Furthermore, it gives hints how to resolve irregularities during operation.
Index	This chapter facilitates the search for specific terms.

## 1.2 Target Group

To use this manual you should know how to handle computer equipment. Furthermore, to connect the SpycerBox to a network or a SAN storage you should have experience as a network administrator and know how to set up the required network connections on your site in hard- as well as software.

When performing maintenance tasks on the SpycerBox hardware, you must be qualified to work on, repair and test electrical equipment.

## 1.3 Conventions Used in this User Guide

The following typographical conventions will be used in this documentation:

- Texts preceded by this symbol describe activities that you must perform in the order indicated.
- Texts preceded by this symbol are parts of a list.



Texts preceded by this symbol are general notes intended to facilitate work and help avoid errors.



You must pay particular attention to text that follows this symbol to avoid errors and possible resulting damages thereof.



Texts following this symbol you must pay particular attention to to avoid dangers and personal injuries.

“ ” Texts enclosed by quotation marks are references to other manuals, guides, chapters, or sections.



## 1.4 Safety Instructions

To use the SpycerBox correctly please heed the following:



Please read the following safety instructions carefully before attempting any installation and/or performing any work on the SpycerBox.

If the SpycerBox is not used in compliance with the safety instructions, the warranty and all resulting liability claims will be void.

### General

The SpycerBox has been built according to the applying safety regulations. To minimize the possibility of a faulty operation of the device all manuals and guides must be available at all times at the operation site. Before installing and/or using the SpycerBox the manuals and guides delivered with the SpycerBox must be read and observed.

- Use the SpycerBox only in apparent good technical order.
- The SpycerBox hardware works with voltages that can be hazardous to your health. Never work on the system or access its interior with the power cable(s) being plugged in. Make sure the power supply is disconnected from the components you intend to work on.
- Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures, they can be destroyed. Use a wrist strap connected to ground when accessing electronic parts and take care of grounding the system. Avoid touching the internal components of the SpycerBox whenever possible.
- Computer hardware contains components that are sensitive to changing voltages. Connecting or disconnecting the SpycerBox to or from peripheral hardware while any of them is switched on may damage the hardware. Switch off all peripheral hardware before connecting or disconnecting anything.
- Use, store and transport the SpycerBox only in compliance with the technical data laid out in section “Technical Data” on page A-4.
- If fluids or solid objects get inside the casing, the SpycerBox must be disconnected from the power supply immediately. Before using the SpycerBox again, it has to be checked by authorized service personnel.
- Only use a damp tissue without any cleaning agents to clean the casing.
- The SpycerBox must not be misused, abused, physically damaged, neglected, exposed to fire, water or excessive changes in the climate or temperature, or operated outside maximum rating.

- Do not perform any changes or extensions to the SpycerBox whatsoever.

### Transportation

The SpycerBox is a very sensitive device. Especially the hard disks of the system must be handled with greatest care. Therefore, observe in case of transportation:

- Handle the SpycerBox with great care.
- Always use the original packing or a similar structured packing for transportation as detailed in section “Packing Instructions” on page A-5.
- Avoid shocks or vibrations during transport. For longer distances it is recommended to use a lifting truck.
- Keep the SpycerBox as a transportation good dry.
- In the warranty period you have to keep the original packing and use it in case of transportation.

### Environmental Conditions

For error-free working and a long service life the SpycerBox needs some basic environmental conditions:

- Do not expose the SpycerBox to sources of heat, such as direct sunlight or a radiator.
- Do not cover or obstruct the ventilation holes of the system.
- Avoid areas with high humidity or dust. Best operating conditions are given in an air-conditioned site.
- Do not expose the SpycerBox to strong electric or magnetic fields.
- Avoid areas where the SpycerBox will be subject to vibrations or shocks.



## 1.5 Important Notes

The following provides information about warranty, a note about the conformity of the product and other general information.

### Warranty Information

This product is warranted to be free of defects in materials and workmanship for a period of one year from the date of purchase. DVS extends this Limited Warranty to the original purchaser.



You have to keep the original packing and use it in case of transportation. Otherwise this warranty will be void.

In the event of a defect or failure to conform to this Limited Warranty, DVS will repair or replace the product without charge. In order to make a claim under this Limited Warranty, the purchaser must notify DVS or their representative in writing of the product failure. In this Limited Warranty the customer must upon DVS's request return the product to the place of purchase or send the defective device to a given address for the necessary repairs to be performed. In the warranty period the customer must keep the original packing and pack the DVS product in it in case of a product return. If the customer is not satisfied with the repair, DVS will have the option to either attempt a further repair, exchange the product or refund the purchase price.

This warranty does not cover:

- Products not developed by DVS Digital Video Systems AG.
- Products not used in compliance with the safety instructions detailed in section "Safety Instructions" on page 1-4.
- Products on which warranty stickers or product serial numbers have been removed, altered or rendered illegible.
- The costs of installations, removals, transportations, or re-installations.
- Costs for transportation damages.
- Damages caused to any other item.
- Any special, indirect, or consequential damages, and damages resulting from loss of use, data, or profits, or business interruption.

### Declaration of Conformity



This product has been tested according to the applying national and international directives and regulations. Further information about this can be found in section "Conformity Declarations" on page A-7.

### Product Disposal (B2B)

Used electrical and electronic products should not be disposed of with general household waste. At the end of its service life you may return the DVS product after appropriate prior notification to either your local distributor or DVS in Germany. DVS will then take the device free of charge to a waste disposal organization which will recycle and reuse it environmental friendly.



### General Notes

Please observe the following general important notes:



Leave about 10 to 15 % of the overall main storage capacity empty of data for performance reasons.



Compared to other alarms sounded by the system the alarm buzzer of the power supply is relatively faint. In a loud environment it may be drowned by other noises. When operating the SpycerBox in a loud environment, it is recommended to check the power supply units (i.e. their LEDs) at regular intervals.





# Overview



This chapter provides a detailed overview of the SpycerBox hardware. The system will be shown in a front and a rear view and all its parts and connectors will be described.



## 2.1 Overview of the Front

This section gives an overview of the front of the SpycerBox.

After an overall overview of the front the DVD drive is described first, followed by details about the controls and items at the top of the system's front. After this the hard disk array of the system will be explained.

### 2.1.1 The Front of the System

This section provides an overview of the front of the system:

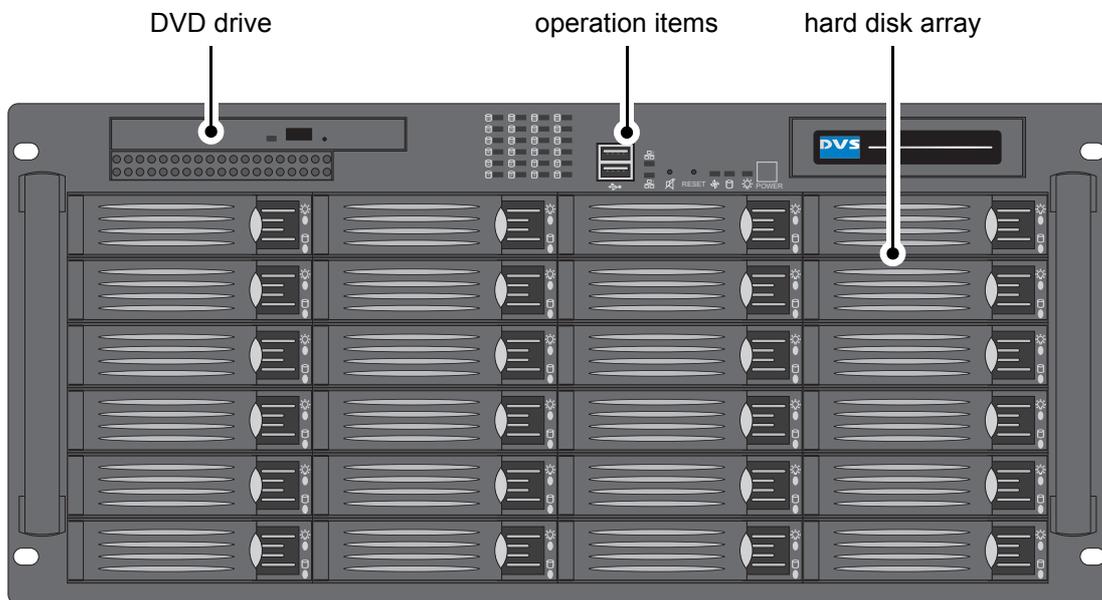


Figure 2-1: Overview of the front

- |                 |  |
|-----------------|--|
| DVD drive       | The DVD drive can be used, for example, for software installations. Further information about the DVD drive can be found in section "DVD Drive" on page 2-3.   |
| operation items | With the operation items the system can be controlled (e.g. turned on or off). Additionally, they offer some LEDs that allow you to assess the state of the SpycerBox as well as USB connectors for an easy connectivity to additional devices such as memory sticks. Further information about the operation items can be found in section "Operation Items" on page 2-4. |

**hard disk array** The hard disk array contains the main storage hard disks which can be used to store video, audio or backup material. All disks can be replaced easily in case of failure. The disk array is described in more detail in section “Hard Disk Array” on page 2-5.

## 2.1.2 DVD Drive

The system is equipped with a DVD drive which can be used for service purposes or to install additional software.

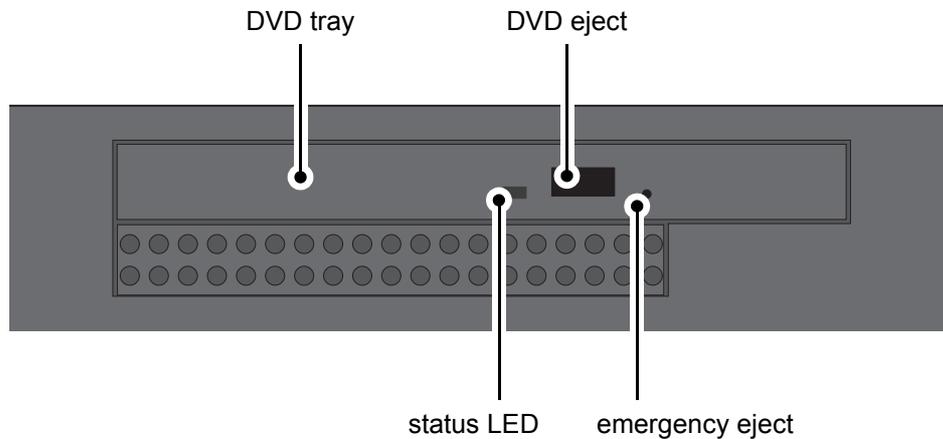


Figure 2-2: Overview of DVD drive



Depending on the type of drive delivered to you, the DVD drive may also provide burning capability.

DVD tray	The DVD tray holds the CD or DVD.
DVD eject	Opens the DVD tray when the system is turned on.
emergency eject	You can open the DVD tray with the system cut from power: Insert a thin, pointed object into the emergency eject hole. Then the DVD tray opens.
status LED	Shows when the drive is accessed by the system.

For further information regarding the operation of the drive, please refer to the original manufacturer’s documentation.



### 2.1.3 Operation Items

With the operation items at the top of the system's front the SpycerBox can be controlled (e.g. turned on or off). There you can also find LEDs that allow you to assess the state of the system as well as USB connectors.

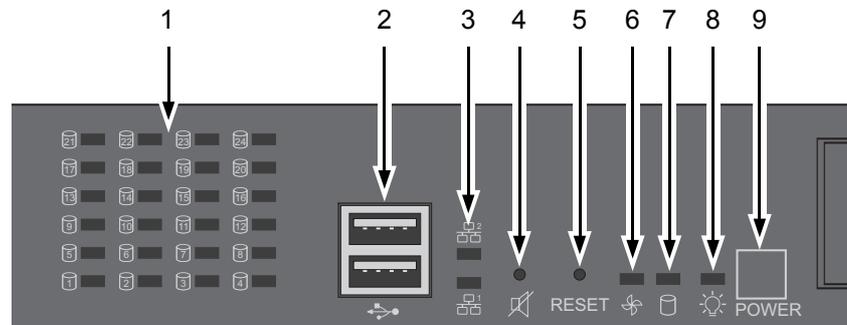


Figure 2-3: Operation items overview

No.	Item	Explanation
1	HDD LEDs	These 24 LEDs indicate the statuses (activities) of the hard disks of the hard disk array (see section "Hard Disk Array" on page 2-5).
2	USB connectors	The two integrated USB connectors (universal serial bus) offer you the possibility to connect other devices such as memory sticks easily.
3	LAN 1/2 LEDs	Indicate that a valid network is connected to the first/second LAN connection at the rear of the system (see section "ATX Connector Panel" on page 2-9).
4	mute	In case of a system malfunction, e.g. a fan failure or overheating, a system alarm turns on. By pressing this button the alarm buzzer can be switched mute.  <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">i</div> <p>Some alarms, e.g. the one in case of a hard disk failure, are independent of the system alarm and cannot be switched mute with the mute button.</p> </div>
5	reset	Resets your system and initiates a warm reboot.  <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">!</div> <p>If possible, save your data before resetting the system. Otherwise data may be lost.</p> </div>

No.	Item	Explanation
6	fan/temp failure LED	If the alarm sounds, this LED will indicate whether the malfunction occurred because of a fan failure or another temperature related problem.
7	HDD failure LED	Without function.
8	power LED	Indicates if the system is turned on or off.
9	power	The power switch turns the system on or off.



Further information about what to do in case of an alarm can be found in section "Troubleshooting" on page A-2.

The system hard disk is not among the hard disks of the hard disk array. It is installed inside the system and not accessible from the outside.

### 2.1.4 Hard Disk Array

The hard disks of the hard disk array are used, for example, to store proxy clips of your video and audio material or backup files of the connected central storage. It is the main storage of the SpycerBox. To prevent data loss in case a hard disk fails, it is normally RAID 5 protected.



Further information about RAID 5 protection can be found in section "Introduction to Hard Disks and RAID 5" on page 5-2.

The system hard disk is not among the hard disks of the hard disk array. It is installed inside the system and not accessible from the outside.

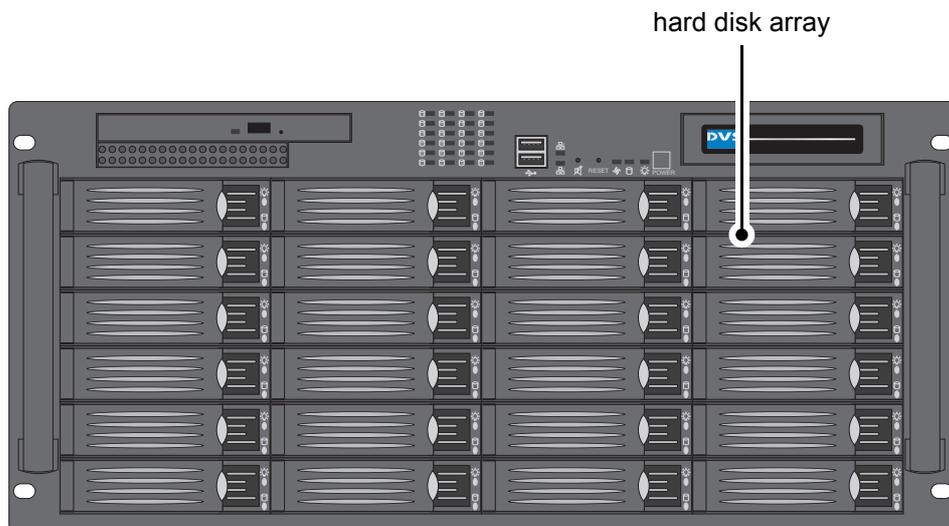


Figure 2-4: Hard disk array



Each hard disk of the array is connected to the system with the help of a disk carrier which makes the removal of a hard disk from the system easy, for example, in the event of a failure.

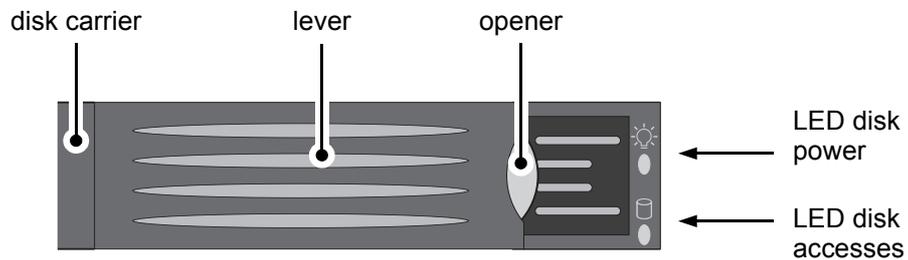


Figure 2-5: Hard disk carrier overview



Further information about how to remove and exchange a hard disk can be found in section “Hard Disk Maintenance” on page 5-2.

disk carrier	The disk carriers hold each one hard disk of the array. Normally a hard disk is mounted to the disk carrier with several screws located at the sides of the carrier.
lever	Once the lever is unlocked with the opener, it can be used to pull the disk carrier and its hard disk out of the system.
opener	Unlocks the lever and with it the disk carrier.
LED disk power	Shows whether the disk of the disk carrier receives power.
LED disk accesses	Indicates the status (activity) of the hard disk of the disk carrier. Same as the respective LED of the HDD LEDs of the operation items (see section “Operation Items” on page 2-4).

## 2.2 Overview of the Rear

This section provides an overview of the rear of the system.

After an overall overview of the rear the power supply will be described first, followed by a detailed description of the ATX connector panel and the slot panel connectors.

### 2.2.1 The Rear of the System

This section provides an overview of the rear of the system:

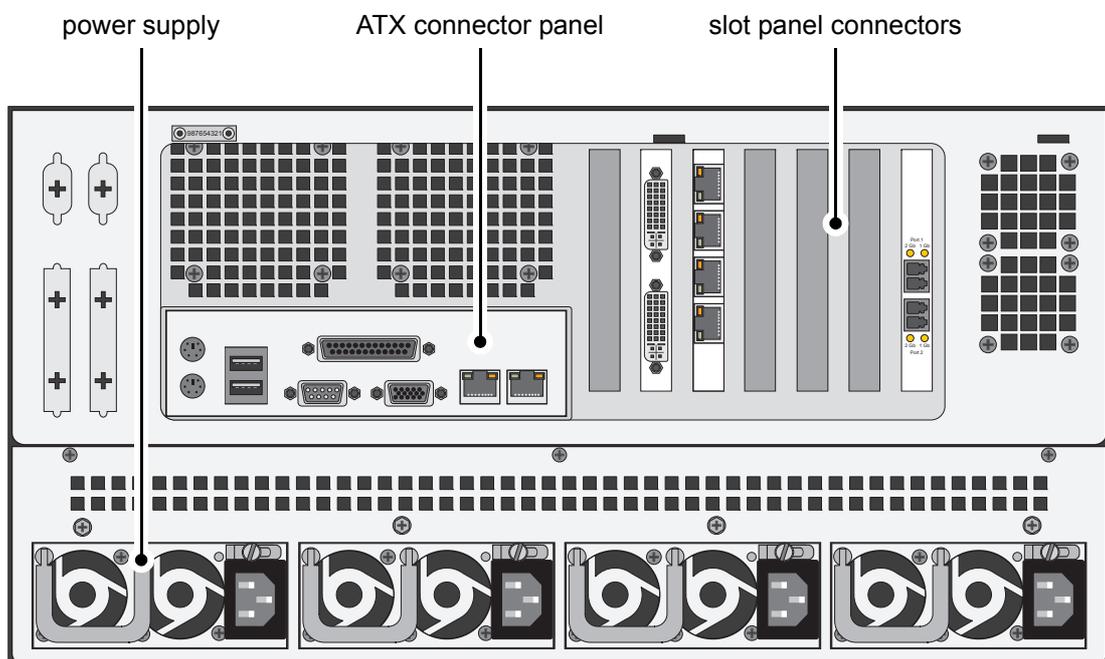


Figure 2-6: Overview of the rear

#### power supply

The redundant power supply provides the system with power. It consists of several independent power supply units: Even if one fails the others will still supply enough power to keep the system operational. Further information about the power supply can be found in section “Power Supply” on page 2-8.

#### ATX connector panel

On this panel you can find the standard connectors of the computer system. It is described in more detail in section “ATX Connector Panel” on page 2-9.

slot panel connectors The slot panel connectors of the SpycerBox provide, for example, the network connections to connect the system to a SAN. Furthermore, if applicable, some additional panels may be present for internal reasons or on customer request. Further details about the slot panel connectors can be found in section “Slot Panel Connectors” on page 2-10.

### 2.2.2 Power Supply

The redundant power supply provides the system with power. It consists of several independent power supply units: Even if one fails the others will still offer enough power to keep the system working.



The system can be operated with one power supply unit out of order. However, if another one fails the system is likely to break down. Therefore, it is recommended to change a failed power supply unit immediately.



For more information about how to deal with a malfunctioning power supply unit see section “Power Supply Maintenance” on page 5-10.

The following provides an overview of one of the power supply units:

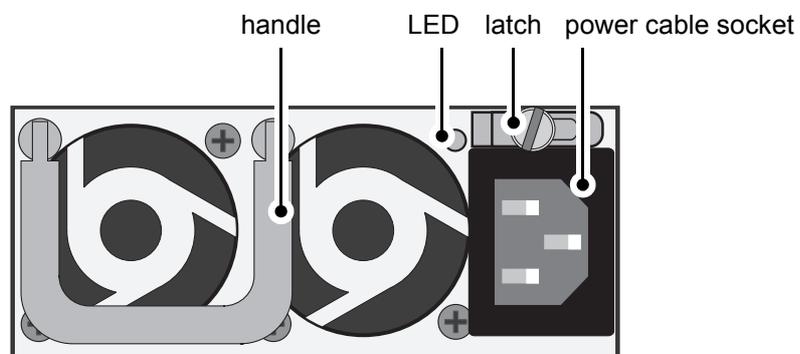


Figure 2-7: Overview of the power supply

- handle With the handle of the power supply unit you can pull the unit out of the power supply once it is unlocked with the latch.
- LED The LED indicates the state of the power supply unit with colors:
  - green The power supply unit is operating normally.

- red The power supply unit has a malfunction (see section "Power Supply Maintenance" on page 5-10).
- off The power supply is either disconnected from power or in standby mode. This may also indicate a malfunction (see section "Power Supply Maintenance" on page 5-10).
- latch The latch of a power supply unit locks it in the power supply. Once the security screw of the latch is removed, the unit can be unlocked and pulled out of the power supply with the help of the handle.
- power cable socket The socket where the power cable has to be plugged in to provide the system with power.

### 2.2.3 ATX Connector Panel

The ATX connector panel on the rear of the SpycerBox holds the connectors of the computer system. It provides the following connections:

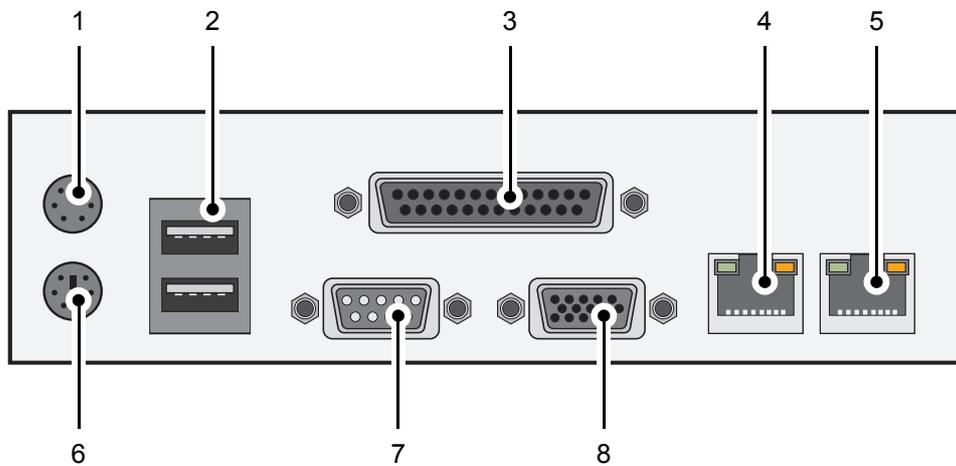


Figure 2-8: ATX connector panel on rear

No.	Item	Explanation
1	mouse	PS/2 connector to connect a mouse to your system.
2	USB ports	These USB connectors (universal serial bus) offer you the possibility to connect other devices to your system.



No.	Item	Explanation
3	parallel port	DB-25 connector for the connection of an external device, such as a printer.
4, 5	LAN (1000 Mb)	Gigabit Ethernet (1000 Base-T) connection ports to connect your system to a network.
6	keyboard	PS/2 connector to connect a keyboard to your system.
7	COM port	RS-232 connector for the connection of serial interface devices.
8	VGA	DB-15 connector (female) to connect a monitor.   If an extra graphic card is installed in your system (see section "Slot Panel Connectors" on page 2-10), this connector will not be operational.

### 2.2.4 Slot Panel Connectors

The SpycerBox provides on its slot panel connector area several connection possibilities such as the network connections to connect the system to a SAN. The following figure shows an example configuration of the slot panel connector area:

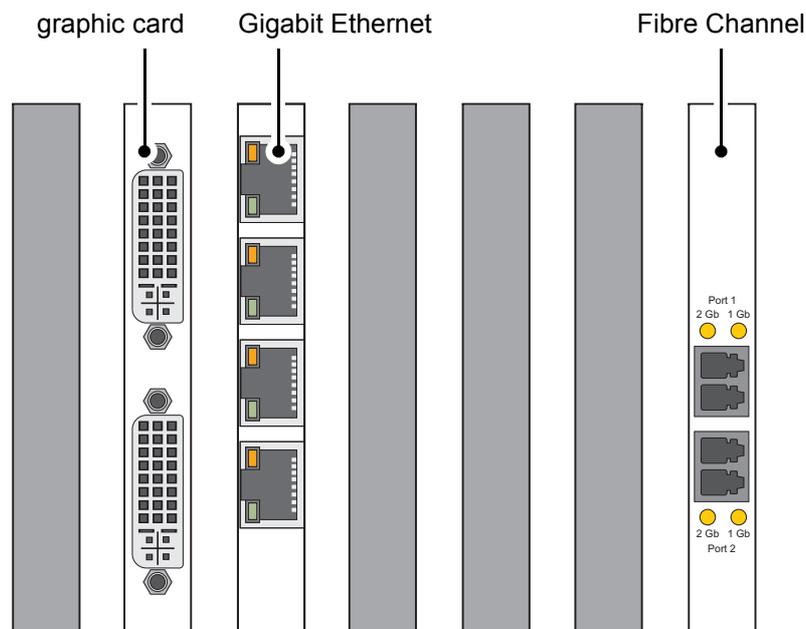


Figure 2-9: Example of a slot panel configuration

The above layout of the slot panel area is just an example. The one on your system may differ from the figure above: The position of the individual slot panels may vary and/or other panels may be installed, either for internal reasons or on your request.

To provide connections to most networks there are various interface possibilities optionally available for the SpycerBox, such as the following:

Gigabit Ethernet	Either a 1 Gigabit Ethernet connection with four ports or a 10 Gigabit Ethernet connection with up to two ports
InfiniBand	InfiniBand connection with up to two ports.
Fibre Channel	Two port Fibre Channel interface.
FireWire	Two port FireWire interface.
graphic card	The on-board graphic card may not be sufficient for real-time previews of larger material. In this case the system will be equipped with an additional graphic card.



If this is installed in your system, the VGA connector available on the ATX connector panel will not be operational (see section "ATX Connector Panel" on page 2-9).





# Installation



This chapter describes the installation of the SpycerBox. It is divided into the setup of the system's hardware and a note about how to connect it to a network.

## 3.1 System Setup

This section describes the setup of the SpycerBox hardware. The system must be installed properly before you can start working with it.

To install the hardware of the SpycerBox perform the following:

- Unpack the SpycerBox and its accessories.



Please check your delivery and compare it with the delivery note which has been included in the package on an extra sheet of paper. In case of missing items, please contact your local vendor or DVS immediately.



To make warranty claims you have to keep the original packing and use it in case of a return transportation.

- Place the SpycerBox on a firm, flat surface within reach of a power outlet or mount it in a rack. For good air circulation and cooling make sure the ventilation holes are not covered.
- Connect at least the following computer peripherals:
  - Mouse,
  - keyboard, and
  - a monitor that is operable at a resolution of at least 1024 × 768 pixels (default manufacturing setting).
- Connect any other peripheral computer equipment. For an overview of the panels and connectors at the system's rear see section "Overview of the Rear" on page 2-7.
- Connect the power cable(s) to the system.



The SpycerBox hardware is now properly installed and you can switch on the system as described in section “Starting the System” on page 4-1.

## **3.2 Note about the Network Installation**

Because of the amount of possible workflows that customer's may use the SpycerBox for as well as network connections (see section “Slot Panel Connectors” on page 2-10), this document does not describe how to connect the SpycerBox to a network or central storage. On the DVS web page (<http://www.dvs.de>) you can find various diagrams showing how the SpycerBox may fit in a workflow/network.

To connect the SpycerBox to a network/central storage you should have experience as a network administrator and know how to set up the required network connections on your site in hard- as well as software. In case you experience difficulties during the installation, DVS offers you special assistance that will be tailored to your personal needs and which can range from remote diagnosis to on-site services. Please contact the DVS service department for further information about this.

# Operation



This chapter describes how to operate the SpycerBox hardware, i.e. it is explained how to start the system and how to shut it down. For both procedures you have to use the power switch of the operation items on the front of the system.



Figure 4-1: The power switch



All other items necessary for a correct operation of the Spycer-Box hardware, such as the LEDs or the reset button, are described in chapter “Overview” on page 2-1.



## 4.1 Starting the System

After a proper installation of the system (see chapter “Installation” on page 3-1) you may start the SpycerBox at any time.

To start the system perform the following:

- Press the power switch briefly to turn on the system.

This will start the system. As with any standard computer after initial booting, the system begins to load the installed operating system. When the operating system has finished its loading, you can begin to work with the SpycerBox right away.

## 4.2 Shutting Down the System

There are several possibilities to shut down the SpycerBox. All depend on whether the operating system is already loaded or not. Please act accordingly.

To shut down the system perform the following according to the state of the system's operating system:



After a shut-down wait at least ten seconds before starting the system again. This time is needed to safely erase all memory banks of the system.

### With the operating system fully loaded

If the operating system is up and running, there are two ways to shut down your system:

1. Turn the system off by shutting down the operating system the usual way.

The operating system will then save your personal settings and once it has ended, the system will turn off.

2. Alternatively, you can initiate a fast shut down by pressing the power switch briefly.



The fast shut down may not save all your system data and personal settings before the system turns off. Occasionally, this may lead to a loss of system data.

Some settings will be saved and afterwards the system turns off.

### With the operating system not completely loaded

If the operating system is not completely loaded, perform the following:



Shutting down the system while the operating system is loading may lead to corrupted system data. Use this procedure only if absolutely necessary.

- Shut down the system by pressing the power switch until the system turns off.

The system will then shut down immediately.

# Maintenance



This chapter explains the maintenance work that you can perform on your own. For each work a detailed procedure description is given. If you experience trouble with the system that cannot be resolved with the work described here or the section “Troubleshooting” on page A-2, please contact your local vendor or DVS directly.



## 5.1 Hard Disk Maintenance

This section deals with the possible event of a hard disk failure as well as further hard disk maintenance tasks. First, some introductory information about hard disks and data protection (RAID 5) are provided. After that follows a description how to act in the event of a hard disk failure.

### 5.1.1 Introduction to Hard Disks and RAID 5

In a system where huge amounts of data are processed the hard disks of the storage are in high-use. Although modern high-performance hard disks are quoted by their manufacturers to have a mean-time-between-failure (MTBF) of between 700,000 and 1,200,000 hours (79 and 136 years), this is merely a statistical average and their typical operational life expectancy is only a few years. To provide the required capacity and data speed it is common practice in the area of video and digital film to configure several hard disks together into a RAID. The IT world has defined several 'levels' of RAID, most of them providing some kind of data protection. Because of this DVS uses RAID 5 to add protection to the stored data as any single disk can fail, but the data will still be recoverable.

The RAID 5 feature makes the SpycerBox tolerant of disk failures. Even with a broken disk an operation can still be continued and, once the failed disk has been replaced, the missing data can be recovered easily.

The main storage of the SpycerBox comprises 24 hard disks and the data is striped across these hard disks. Additionally, it provides three RAID controllers that each connects a set of eight hard disks. The RAID controllers are independent RAID 5 systems and make the data protection available for the connected hard disks. The information necessary to rebuild a failed hard disk (parity information) is generated and written across the disks connected to a RAID controller. Thus, for each controller present in the SpycerBox one hard disk can fail and the system will still be functional and able to recover data.

You can identify the hard disks that are connected to a RAID controller easily in the SpycerBox because every two rows represent one disk set:



Figure 5-1: Disk sets in the DVS system

If one hard disk within a disk set fails, the missing data can be recalculated due to the parity information stored on the other disks of the set. Thus, a DVS system equipped with RAID 5 can withstand disk failures without losing data or access to data.



If a second disk within the same disk set fails, your data will be unrecoverable.

### 5.1.2 Replacing a Hard Disk

In case of a hard disk failure an alarm will be sounded. Then during continuous accesses to the hard disk array you can identify the broken disk easily: It will be the one no longer blinking (either continuously on or off). With this you have the possibility at hand to replace the broken disk.



An alarm can be caused by a number of reasons. Please refer to section “Troubleshooting” on page A-2 first for further details about what to do in case of an alarm.

If a hard disk of the hard disk array fails, the alarm will be sounded by a RAID controller. It cannot be switched mute with the mute button of the operation items. It can be turned off either with the RAID software manager or by simply replacing the broken hard disk.

Data accesses to the hard disk array are still possible because any missing data will be recalculated from the parity information distributed among the other hard disks of the disk set.



Replace the failed disk as soon as possible. If you do not replace a broken disk in time and another disk fails in the meantime, your data may be unrecoverable.



The hardware replacement of a failed disk can be divided into three steps:

1. Remove the hard disk from the system.
2. Replace the hard disk.
3. Reassemble it into the system.

All steps are explained in the following.

### Step 1: Removing the Hard Disk

The hard disks that are accessible at the front of the system store the data of the main storage. Because they are connected to the whole system with the help of disk carriers, they can be removed easily.



For an overview of a disk carrier as well as further information about it see section "Hard Disk Array" on page 2-5.

To remove a hard disk from the system perform the following:

- If appropriate, stop all accesses to the hard disk array of your system, for example, by severing the network connections.
- Unlock the disk carrier of the defective hard disk by pressing the opener of the disk carrier to the left (1).

This will cause the lever to come out of the disk carrier so that it protrudes a little from the rest of the front.

- Take the lever and turn it more to the left (2) until it cannot be moved further:

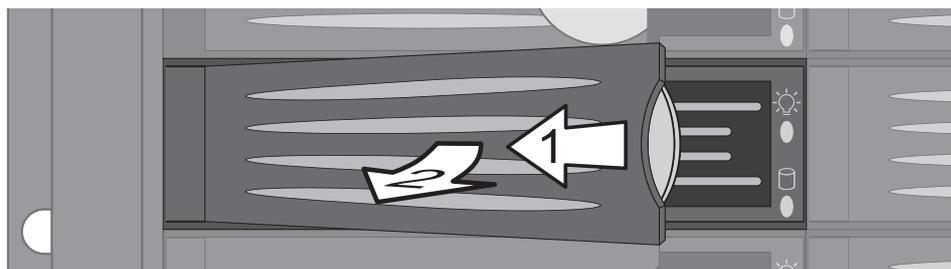


Figure 5-2: Pulling out the lever

This takes the hard disk installed in the disk carrier out of the system's interfaces inside.

- Once the interface connection inside the system is severed, you can pull the disk carrier out of the system.

Now the hard disk is removed from the system and it has to be replaced in the next step.

## Step 2: Replacing the Hard Disk

To replace the hard disk do the following:



Significant environmental changes, for example, altitude, voltage, temperature, shock, vibration, etc., can damage a hard disk. Therefore, handle hard disks with great care.

- Unscrew the screws that fix the hard disk to the disk carrier.
- Exchange the broken disk with a new one and assemble it in the disk carrier with the screws.



It is best to use the same brand and type of hard disk again. Otherwise a loss of performance might occur.

After that the hard disk is replaced and the disk carrier with the new disk has to be reassembled in the system.

## Step 3: Reassembling the Hard Disk

After replacing the hard disk, the disk carrier with the new disk has to be reassembled in the system. For this perform the following:

- Slide the disk carrier back into its shaft at the front of the disk array.
- Push it completely back into the shaft by applying pressure to the disk carrier directly (i.e. do not use the lever to push the carrier). Move it until you feel the resistance of the hard disk interface inside the system and until the lever retracts by itself from the pushing.



It is important that you do not use the lever to insert the disk carrier. Apply an even pressure only to the carrier directly until the lever moves back by itself.

- Then simply close the lever until it snaps back in place which as a result will slide the carrier completely back in.



The disk carrier of the replaced disk should be level with the others at the front of the system's disk array.

With this the replacement of the hard disk is finished. After several minutes the replaced hard disk will be automatically recognized by the system. Then the rebuild of the data will be initiated on its own. Once the system has finished the rebuild, the SpycerBox will be fully operational again.



A rebuild takes several hours. It is strongly recommended to avoid accesses to the hard disk array during this time, otherwise it may take considerably longer.



## 5.2 Opening and Closing the Casing

Some tasks described in this manual require an opening of the system's casing and the closing of it afterwards once the intended work is finished. Both tasks will be explained in this section.

### 5.2.1 Opening the Casing

To open the casing of the SpycerBox system perform the following:



The system you are working on operates with voltages that can be hazardous to your health. Never work on the system or access its interior with the power cable(s) being plugged in. Make sure the power supply is disconnected from the components you intend to work on.



The system must be operated only with the chassis' top cover installed.

- If appropriate, shut down the system.
- Disconnect all power cords from the casing.
- Press the two buttons at the top of the system casing (1) and move the top cover towards the rear of the system (2).

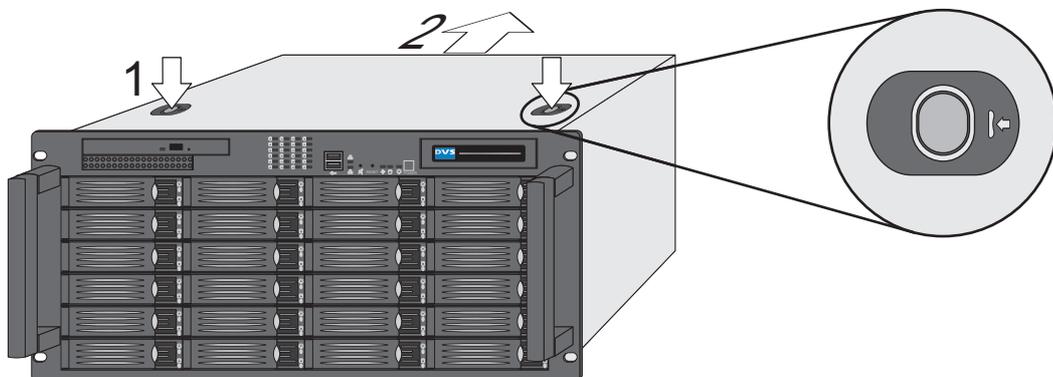


Figure 5-3: Removal of the top cover of the casing

Once the cover is slid backward, it can be taken off the system.

### 5.2.2 Closing the Casing

After finishing your task at hand (e.g. a fan maintenance) you have to close the casing of the SpycerBox system again. For this perform the following:

- Simply put the cover back on and slide it into place until it locks.

- Afterwards reconnect the power cords.

With this the task to close the casing is finished and you can turn the system back on at any time.

## 5.3 Fan Maintenance

To cool the many hard disks installed in the system as well as the other electronic parts (e.g. the motherboard), the system is equipped with several fans that can be exchanged in case of a failure easily. This section describes what to do if a fan failure takes place.

When a fan failure occurs, you will be notified by a lit alarm LED and the sounding of the alarm buzzer of the system. The alarm can be switched mute with the mute button at the front of the system (see section "Operation Items" on page 2-4). Then you have to do the following to exchange the failed fan:



An alarm can be caused by a number of reasons. Please refer to section "Troubleshooting" on page A-2 first for further details about what to do in case of an alarm.



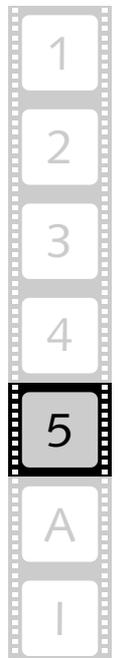
The system you are working on operates with voltages that can be hazardous to your health. Never work on the system or access its interior with the power cable(s) being plugged in. Make sure the power supply is disconnected from the components you intend to work on.

Fan maintenance should only be performed by personnel qualified for handling and testing electrical equipment.



Computer hardware contains components that are sensitive to electrostatic discharge. If you touch them without precautionary measures, they can be destroyed. Use a wrist strap connected to ground when accessing electronic parts and take care of grounding the system. Avoid touching the internal components of the computer system.

- Open the casing of the system as described in section "Opening the Casing" on page 5-6.



With the casing of the system open, you can now test the fans. For this you have to plug in the power supply again.



Testing the fans is possible only with an opened casing and the power turned back on.

Once the power cables are plugged in again do not touch anything else than the external power cords or the power switch at the front of the system. Under no circumstances reach inside the system.

After testing the fans switch off the power and disconnect the power cables immediately.

- Reconnect the power cords.
- Press the power switch to turn on the system.
- Observe the fans and memorize the failed one (the fan not revolving is the broken one).
- Press the power switch until the system turns off.
- After this disconnect the power cables once again.

With the broken fan identified you can replace it. For this perform the following:

- Press the latch of the respective fan module towards the front of the system (1).
- With the locking mechanism released pull the fan module up and out of the system (2).

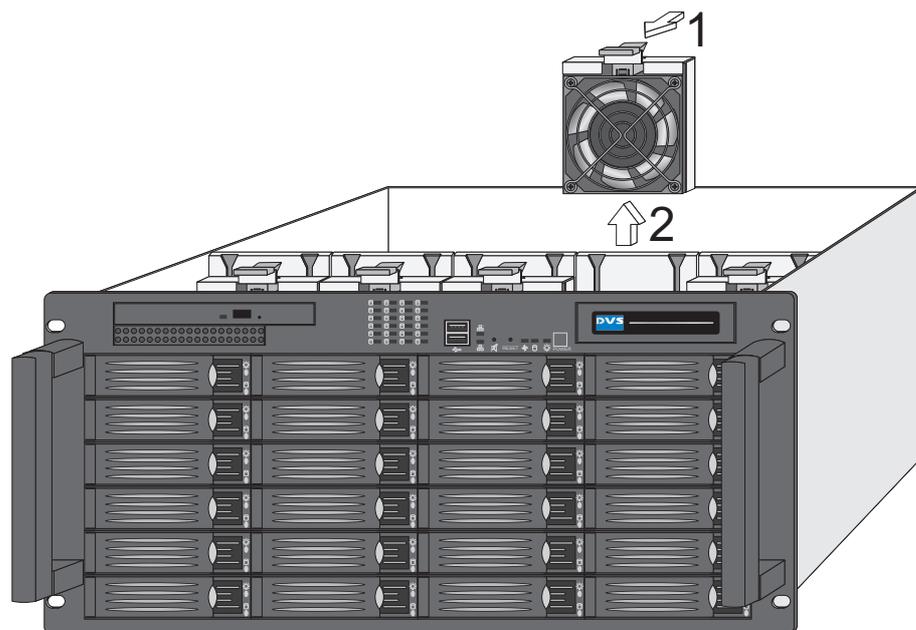


Figure 5-4: Removal of fan module

This will sever the connection of the fan to the system.

- Unscrew the finger protection grille from the broken fan and afterwards screw off the fan from the fan bracket.
- Replace the broken fan with a new one and reassemble the fan module: Screw the fan to the fan bracket and afterwards the finger protection grille to the fan.



Only use original manufacturer spare parts. Other spare parts might damage your system.

- Re-insert the repaired fan module into the system.



See to it that the fan module plugs properly into the system's fan interface and that, when completely inserted, the locking mechanism snaps back into its locked position.

- Next, close the casing of the system as described in section "Closing the Casing" on page 5-6.

With the last step finished you have successfully replaced the defective fan module. Once the system is turned on, no alarm should be sounded anymore.



## 5.4 Power Supply Maintenance

The redundant power supply provides the system with power. It is a very reliable and enduring part of the system because it consists of several independent power supply units: Even if one fails the others will still offer enough power to keep the system working.



The system can be operated with one power supply unit out of order. However, if another one fails the system is likely to break down. Therefore, it is recommended to change a failed power supply unit immediately.

When a power supply unit failure occurs, you will be notified by the sounding of an alarm buzzer of the system. The alarm can be switched mute with the mute button at the front of the system (see section "Operation Items" on page 2-4).



An alarm can be caused by a number of reasons. Please refer to section "Troubleshooting" on page A-2 first for further details about what to do in case of an alarm.

Compared to other alarms sounded by the system the alarm buzzer of the power supply is relatively faint. In a loud environment it may be drowned by other noises. When operating the SpycerBox in a loud environment, it is recommended to check the power supply units (i.e. their LEDs) at regular intervals (see section "Power Supply" on page 2-8).

Each power supply unit in the SpycerBox system is hot-swappable, so you can safely replace it with the system running. Follow these steps to replace a power supply unit:



For an overview of a power supply unit see section "Power Supply" on page 2-8.

- Take a look at the power supply at the rear of the system and examine the LEDs of the units. The LED of the malfunctioning power supply unit should be either extinguished or lit in red.
- Next unplug the power cord from this power supply unit.
- Unscrew the security screw of the latch.
- Take the handle of the respective unit and press the unit's latch to the left to unlock it.
- Then pull the unit at its handle out of the power supply.



Do not reach inside the system when removing a power supply unit or when the unit is out of the system.

- Change the power supply unit against a new and operable one.

- Slide the new unit into the power supply until it clicks into place.



Only use original manufacturer spare parts. Other spare parts might damage your system.



When completely inserted, please observe that the latch is truly in place and locking the unit.

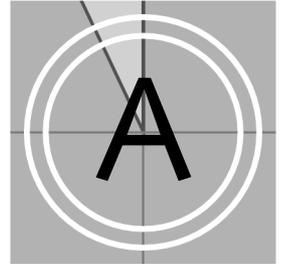
- Connect the power source (the power cord) to the newly installed power supply unit.
- After that check the LED indicating the status of the power supply unit: If it is lit up in green, the unit is working properly.

With this the power supply unit has been replaced successfully.





# Appendix



This chapter first gives some hints how to resolve irregularities during operation. After that technical data and general information about the SpycerBox are provided.



## A.1 Troubleshooting

The table below lists some errors that may occur during the operation of the SpycerBox and details how to resolve them. If you experience trouble with the system that cannot be resolved with the solutions described here or in section “Maintenance” on page 5-1, please contact your local vendor or DVS directly.

Error	Cause	Solution
Accesses to the main storage are slow.	The data storage is too full.	It is recommended to use only 85 to 90 % of the overall hard disk capacity. If the storage is too full, delete some of your data.
	Configurations of the system or its network ports have been altered.	Contact your local system and network administrator and try to reconfigure the SpycerBox. If this is not possible contact the DVS service department.
	One or more hard disks of the hard disk array are worn.	Detecting worn hard disks in a RAID protected storage can prove difficult. If you are able to detect the worn disk(s), replace them as described in section “Hard Disk Maintenance” on page 5-2. Otherwise contact the DVS service department.
An alarm is sounded and the fan/temp failure LED is lit.	A fan has failed.	Shut down the system (see section “Shutting Down the System” on page 4-2) and check whether a fan has failed (see section “Fan Maintenance” on page 5-7). If necessary replace the broken module as described in the same section.
	The system is overheated.	An overheating rarely occurs, and then most likely caused by too much dirt accumulated at the ventilation holes. Shut down the system immediately (see section “Shutting Down the System” on page 4-2). Afterwards open the casing as described in section “Opening the Casing” on page 5-6 and clean all ventilation holes. When finished, reassemble the system (see section “Closing the Casing” on page 5-6) and start it. In case the problem persists, contact the service department of DVS.

Error	Cause	Solution
An alarm is sounded and the fan/temp failure LED is off. The alarm can be switched mute with the mute button.	One of the power supply units has been disconnected from power during operation.	Check the LEDs of the power supply units. If one is extinguished or lit in red, this unit may be disconnected from power. Examine the power cord of the unit. See to it that it is correctly plugged in at both ends and that the mains current is operating properly.
	One of the power supply units has failed.	Check the LEDs of the power supply units. If one is extinguished or lit in red, a power supply unit has failed. Replace the broken unit as described in section "Power Supply Maintenance" on page 5-10.
An alarm is sounded and the fan/temp failure LED is off. The alarm cannot be switched mute with the mute button.  OR At start-up the system is not able to initialize a disk set, i.e. one or more hard disks are not recognized by the system.	A hard disk or a hard disk carrier of the hard disk array got loose/jammed (e.g. after transport) or is not mounted correctly.	Shut down the system as described in section "Shutting Down the System" on page 4-2. Then perform the following: Pull all disk carriers partially out of the chassis and afterwards install them again. See to it that they are pulled out and reassembled correctly as described in section "Replacing a Hard Disk" on page 5-3. After that start the system again.
	A hard disk of the hard disk array is defective.	Replace the defective disk as explained in section "Hard Disk Maintenance" on page 5-2.



## A.2 Technical Data

The following shows the technical data of the SpycerBox:

Dimensions	height: 220 mm (5 HU) width: 430 mm depth: 660 mm
Weight	approx. 70 kg
Environment (also during transport)	No exposure to heat No exposure to strong electric or magnetic fields No vibrations/shocks allowed
Operating temperature	Maximum: 10 - 30 °C (50 - 86 °F) Optimum: 15 - 25 °C (59 - 77 °F)
Storage temperature	0 - 50 °C (32 - 122 °F)
Humidity	10 - 80 %, non-condensing at all times
Air	Dust-free
Power consumption	max. 3000 W (primary)
AC power	100 - 120 VAC, 220 - 240 VAC

### A.3 Packing Instructions

The following describes the best way to pack a DVS system.



Keep the original packing and use it in case of transportation. Otherwise the warranty will be void.

In any other case, if you do not have the original packing anymore, use a similar structured packing for transportation. DVS can not be held liable for damages due to transportation.



Fragile. Avoid shocks or vibrations. For longer distances use a lifting truck.



Keep dry.

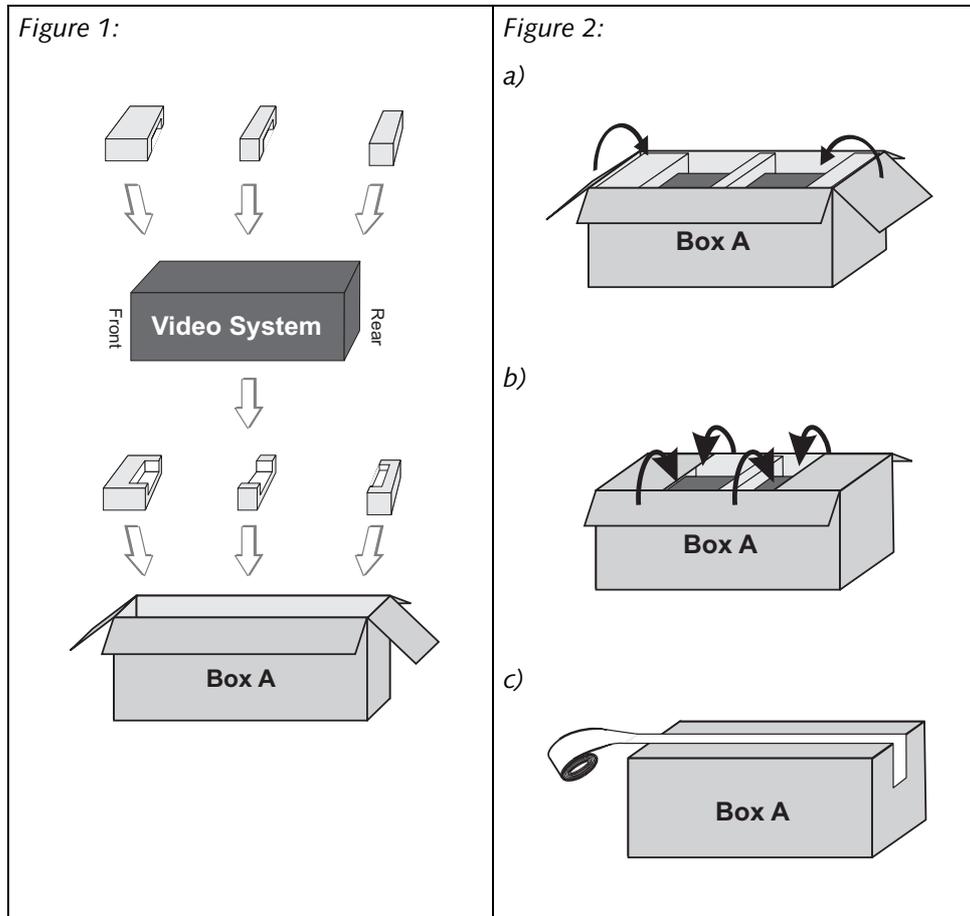


Figure 3:

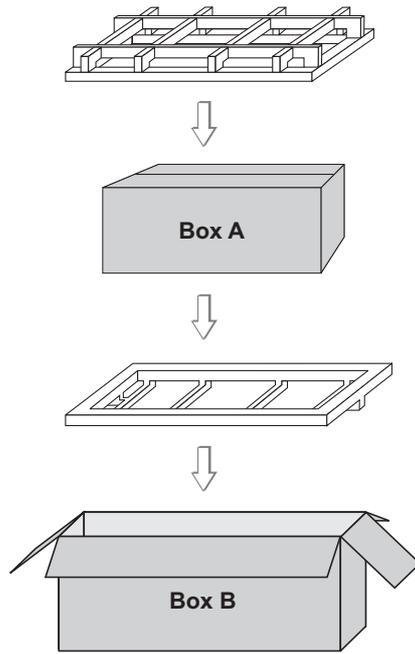


Figure 4:

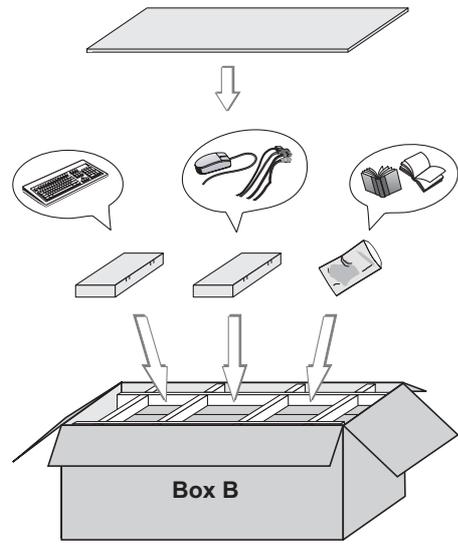
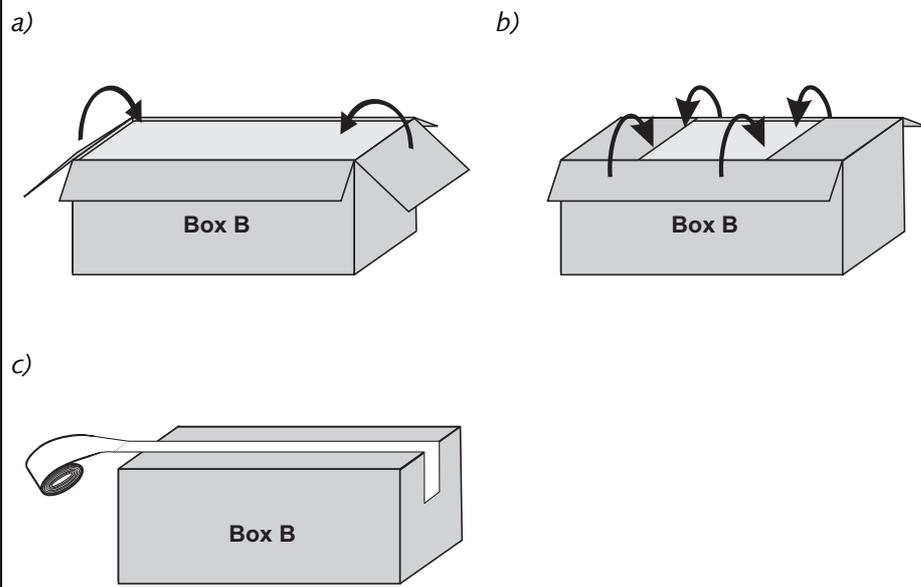


Figure 5:



## A.4 Conformity Declarations

SpycerBox has been tested according to the applying national and international directives and regulations. The following states further information about the compliances and conformities.

### A.4.1 RoHS Compliance

The EU directive 2002/95/EC 'Restriction of Hazardous Substances (RoHS)' prohibits the use of certain substances in electrical and electronic equipment. The SpycerBox devices are manufactured in compliance with this directive.

### A.4.2 EC Declaration of Conformity (CE Marking)

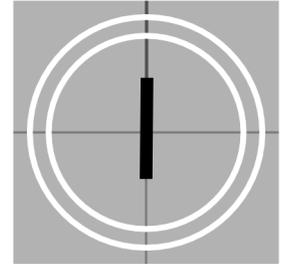
DVS Digital Video Systems AG herewith declares that the following product(s) according to the provisions of the mentioned EC Directives – including their relevant revisions at the time of this declaration – is (are) in conformity with the detailed standards or other normative documents:

<b>SpycerBox</b>	EC Directives: <ul style="list-style-type: none"> <li>– EMC Directive 2004/108/EC</li> <li>– Low-Voltage Directive 2006/95/EC</li> </ul>
	Applied Harmonized Standards: <ul style="list-style-type: none"> <li>– EN 55022</li> <li>– EN 55024</li> <li>– IEC 61000-3-2</li> <li>– IEC 61000-3-3</li> <li>– IEC 61000-4-2</li> <li>– IEC 61000-4-3</li> <li>– IEC 61000-4-4</li> <li>– IEC 61000-4-5</li> <li>– IEC 61000-4-6</li> <li>– IEC 61000-4-8</li> <li>– IEC 61000-4-11</li> </ul>





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